Introduction

Hypertension contributes to the development and progression of chronic complications of diabetes. The primary goal of therapy for adults should be to decrease blood pressure to < 130/80. Epidemiological analysis of the United Kingdom Prospective Diabetes Study (UKPDS) showed a continuous relationship between the level of systolic blood pressure and the risk of stroke, diabetes-related deaths, heart failure, microvascular complications, and visual loss.

Lifestyle modifications such as weight loss, exercise, smoking cessation, and prudent reduction of salt and alcohol should be a major aspect of treatment of hypertension. Home blood pressure monitors also have a role in helping to manage hypertension aggressively in people with diabetes. Medications should be added to lifestyle changes if those interventions are not successful in controlling hypertension.

For people with diabetes, clinical trials demonstrate the value of setting an aggressive blood pressure target of less than 130 mmHg systolic and less than 80 mmHg diastolic. All improvements in blood pressure can lead to appreciable benefits. The determination of hypertension is confirmed by a second reading on a separate day. Orthostatic measurement is recommended to rule out autonomic neuropathy. Orthostatic hypotension is defined as a fall in the systolic blood pressure of 20-30 mmHg or diastolic blood pressure of 10-15 mmHg after two to three minutes of standing. Cardiovascular autonomic neuropathy causing orthostatic changes in blood pressure is common in diabetic patients and can cause falsely low or high readings. Blood pressure and pulse should ideally be measured both in the supine and standing position leaving two minutes in between readings. Two or more determinations in each position should be obtained using an appropriately sized cuff. If the first two readings differ by more than 5mmHg, additional readings should be obtained and averaged.

Benefit of Aggressive Treatment

The results of the UKPDS blood pressure study indicate that aggressive treatment of even mild-to-moderate hypertension is beneficial. Continued reduction of blood pressure into the normal range reduced strokes, diabetes-related deaths, heart failure, and microvascular complications, including retinopathy, nephropathy, and possibly neuropathy. Both systolic and diastolic hypertension markedly accelerate the progression of diabetic nephropathy. In other studies, control of hypertension has been demonstrated conclusively to reduce the rate and progression of nephropathy and to reduce the complications of cerebrovascular disease and cardiovascular disease (CVD).

Treatment

In non-pregnant diabetic patients ≥ 18 years of age, the primary goal for therapy is to decrease blood pressure to and maintain it at < 130 mmHg systolic and < 80 mmHg diastolic. A maximum three-month trial of lifestyle/behavioral modification is recommended for those with a SBP 130-139 mmHg or a DBP of 80-89 mm/Hg. If target levels are not reached by the end of three months, pharmacologic therapy should be instituted. Patients with SBPs of ≥ 140 mmHg or DBPs ≥ 90mmHg should receive prescriptions for both antihypertensive medication as well as lifestyle changes.

Treatment Goals

SYSTOLIC	DIASTOLIC	COMMENT
<130	< 80	Target Blood Pressure
130-139	80-89	Behavorial therapy alone (maximum 3 months), then add drug therapy
≥ 140	≥ 90	Behavorial therapy plus drug therapy

Pharmacologic Therapy

Initial drug therapy may begin with any currently recommended antihypertensive medication; however, evidence suggests that the use of angiotensin-converting-enzyme (ACE) inhibitors, beta blockers, and diuretics will reduce cardiovascular events, and are therefore preferred for initial therapy for those with uncomplicated hypertension. In addition, ACE inhibitors are recommended for both normotensive and hypertensive patients over the age of 55 who have an additional risk factor for CVD. To reduce mortality, the addition of a beta-blocker should be considered for those who have had a recent MI. Angiotensin receptor blockers (ARBs) may be substituted if ACE inhibitors are not tolerated; however, ARBs to date have demonstrated no additional cardiovascular benefit. Evidence also suggests that treatment with an ACE inhibitor slows the progression of microalbuminuria among patients with type 1 diabetes, even if normotensive. In patients with type 2 diabetes, both ACE inhibitors and ARBs have been shown to reduce the progression to macroalbuminuria. Many patients will

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require three or more drugs to achieve the recommended target blood pressure levels. Patients not achieving target levels on three drugs, including a low-dose diuretic, should be referred to a specialist experienced in the care of patients with hypertension. Due to their teratogenic potential, caution is advised when using either ACE inhibitors or ARBs in women of childbearing age. **Refer also to the Nephropathy section.**

Sources:

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